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NATIONAL SYSTEMATICS LABORATORY REPORT FOR CALENDAR YEAR 1989

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U.S. DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

National Marine Fisheries Service

ANNUAL REPORT

NATIONAL SYSTEMATICS LABORATORY

CALENDAR YEAR 1989

June 1990
Washington, DC

U.S. DEPARTMENT OF COMMERCE
Robert A. Mosbacher, Secretary

National Oceanic and Atmospheric Administration
John A. Knauss, Under Secretary for Oceans and Atmosphere

National Marine Fisheries Service
William W. Fox, Jr., Assistant Administrator for Fisheries

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1989 HIGHLIGHTS

* A list of scientific and common names of decapod crustaceans of the United States and Canada has been issued by the American Fisheries Society.

* A year long exhibit on lobsters opened at the Smithsonian's Natural History Museum.

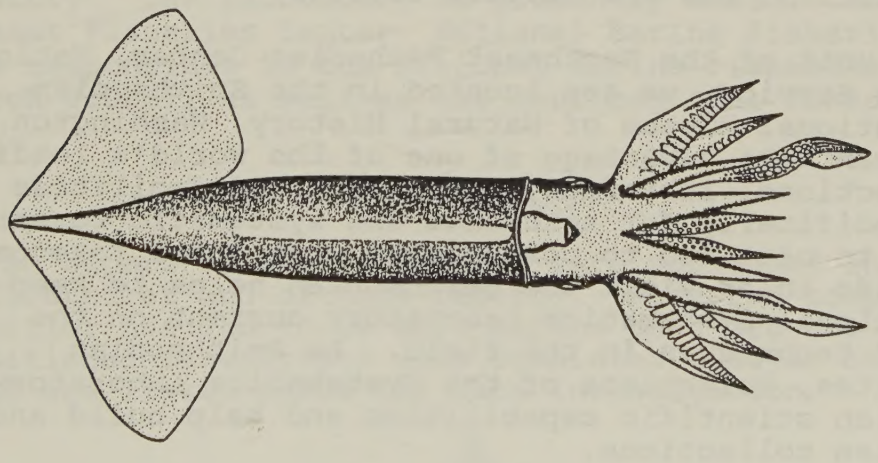
* Published a guide to the squids and octopods of the Northeast continental shelf.

* Laboratory director received award recognizing published contributions in systematic ichthyology.

* Monograph on systematic position of the louvar published by the Smithsonian.

* Paper separating two species of sand lances (Ammodytes) in the western Atlantic accepted for publication in the Fishery Bulletin.

* Extensive progress was made on the systematics of tonguefishes (Symphurus)- one paper was published, three accepted, and one more submitted.



Ommastrephes bartrami, a widespread, commercially valuable squid.

MISSION

The National Systematics Laboratory conducts taxonomic research on marine organisms of economic and ecological value to the United States. In addition to providing taxonomic information on species that are commercially important, scientific studies conducted by Systematics Laboratory personnel comprise significant contributions to the study of marine biodiversity by describing and naming new species as well as revising existing names and descriptions based on new information. Because many important species are widespread or migratory, our research is world-wide.

Accurate taxonomic information is the critical first step in recognizing individual species. Additionally, this information provides an understanding of the diversity of marine communities and is the necessary basis for proper management of our nation's living marine resources. Without a clear understanding of what individual species look like, where they are found, and what their names are, we cannot collect accurate statistics, develop reasonable national fishing and conservation regulations, set catch limits, or begin to understand the complexity and diversity of marine communities.

The Systematics Laboratory is involved actively in studying the taxonomy and biodiversity of fishes, crustaceans, squids and corals. We have a permanent staff of five scientists, a scientist emeritus, one technician, a scientific illustrator, and a secretary. Additional personnel and guest scientists that are assigned occasionally on a temporary basis are listed along with the permanent staff at the end of this report.

A research unit of the Northeast Fisheries Center, National Marine Fisheries Service, we are located in the Smithsonian Institution's National Museum of Natural History, Washington, D.C., where we can take advantage of one of the world's leading systems of collections, libraries, equipment, and facilities that are designed specifically for taxonomic and systematic research. The opportunity to meet and to communicate with other taxonomic experts who reside in or visit the Smithsonian helps to keep the staff of the National Systematics Laboratory current on the latest ideas and techniques in the field. As Smithsonian Research Associates, scientists of the Systematics Laboratory expand Smithsonian scientific capabilities and help build and curate Smithsonian collections.

The Systematics Laboratory has two major responsibilities, research and service. Our research produces two principal products: 1) worldwide and regional taxonomic monographs. These are scholarly documents that identify, describe, and catalogue the diversity of species within selected taxa of marine organisms of commercial or ecological importance; and 2) various aids to

identification. These documents provide the necessary information for non-specialists to recognize and identify marine organisms.

The Systematics Laboratory serves many public as well as private institutions and individuals worldwide by providing expert identifications and information for a diversity of marine organisms including, but not limited to, the groups we study. We also review and comment upon manuscripts for scientific journals and for colleagues in the National Marine Fisheries Service, other agencies, and academia. Our staff evaluates research proposals for the National Science Foundation, Sea Grant, and similar research funding agencies.

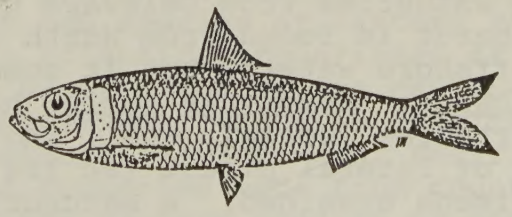
In addition to these activities, staff members serve as officers of various scientific associations and participate in university affairs as research associates and adjunct professors.

HISTORY

The origin of the National Systematics Laboratory can be traced back to 15 August 1942, when Samuel F. Hildebrand moved into the Division of Fishes of the National Museum of Natural History to continue his ichthyological research for the Department of the Interior's Bureau of Fisheries; this followed the merger of the Bureau of Fisheries fish collection with that of the U. S. National Museum. The Laboratory, then the National Center for Systematics, was transferred from the Department of the Interior to the National Oceanic and Atmospheric Administration in 1970 and renamed the National Systematics Laboratory. The Laboratory is presently administered by the Northeast Fisheries Center, National Marine Fisheries Service, but is responsible to the National Marine Fisheries Service Research Council as well as all four regional Fisheries Centers.

RESEARCH

Ten papers by NSL scientists were published in calendar year 1989 (listed at end of this report). Research completed in 1989 and earlier has led to 17 more papers that are now in press and 15 additional manuscripts were completed. Major accomplishments in 1989 are listed below for each investigation.



Spanish sardine, Sardinella atricauda.

FISHES

Pelagic fishes of great importance to man live in the highly productive surface layers of the ocean where species tend to grow large and range widely. Emphasis is devoted to studying the anatomy and systematics of scombroids, the group that includes the tunas, Spanish mackerels, bonitos, and mackerels. Although many of the species have been known for a long time and an extensive literature treats them, detailed anatomical descriptions and comparisons are few, incorrect scientific names are often used, geographical ranges for many are not delimited precisely, and poorly documented classifications are current. The giant tunas, bonitos, and Spanish mackerels found around the world have been treated by Dr. Collette and colleagues in a series of monographs and papers.

Studies of another group of ecologically and commercially important pelagic fishes, the clupeoids (anchovies, herrings, and sardines) have begun by Dr. Munroe with an investigation of the species of Spanish sardines (Sardinella) occurring in the Gulf of Mexico. Present research has focused on identification of useful diagnostic characters for recognition of the species occurring in the western Atlantic.

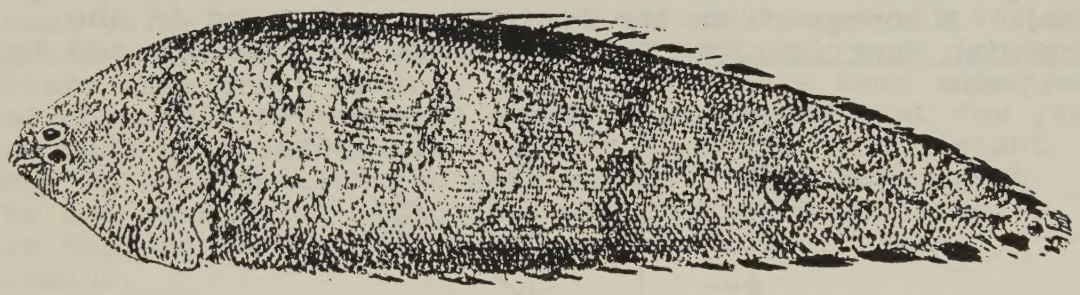
Several other groups of fishes are also under study. These include halfbeaks (Hemiramphidae) and needlefishes (Belonidae), abundant fishes, which are important forage species and are of local importance as food and bait. Monographs on these two families are being prepared by Dr. Collette for the series, "Fishes of the Western North Atlantic". Also under study are sand lances (Ammodytes) of the western North Atlantic by Ms. Nizinski and co-workers, and the tonguefishes (Symphurus) by Dr. Munroe and co-workers.

1. Revision of Fishes of the Gulf of Maine.- A revision of Henry B. Bigelow and William C. Schroeder's classic 1953 volume Fishes of the Gulf of Maine is underway by Drs. Bruce B. Collette and Grace Klein-MacPhee. Drafts of revised accounts for skates and rays were produced by a cooperating specialist in 1989.

2. Sand lance taxonomy.- An investigation of the taxonomy of sand lance (Ammodytes) in the northwest Atlantic demonstrates the presence of two species in this area. An inshore species, A. americanus DeKay, occurs in shallow coastal waters as well as in protected bays and estuaries from Delaware to Labrador. Ammodytes dubius Reinhardt is found from North Carolina to Labrador, mostly in offshore waters, but it sometimes occurs inshore with A. americanus. Ammodytes dubius has higher counts of lateral plicae, vertebrae, dorsal, anal, and pectoral rays and gill rakers. Numbers of lateral plicae (at 124 vs. 125) separate more than 98% of specimens examined. A manuscript was accepted for publication in the Fishery Bulletin in 1990.

3. Tonguefish taxonomy.- Tonguefishes (Symphurus) are an abundant group of small to medium-sized flatfishes that comprise significant portions of the demersal fish fauna inhabiting sandy and muddy substrates of the coastal continental shelves off the southern United States, Mexico, and Central America. More than 45 species of tonguefishes are currently recognized in the eastern Pacific and western Atlantic, including several undescribed species. This genus is being revised by Dr. Munroe.

During 1989, data were collected from over 1700 specimens of eastern Pacific tonguefishes borrowed from the Field Museum of Natural History, Chicago; Los Angeles County Museum; California Academy of Sciences, San Francisco; Scripps Institution of Oceanography, La Jolla; University of California at Los Angeles; and University of Arizona, Tucson. Many unidentified specimens were brought to the Systematics Laboratory, identified, X-rayed, and included in analyses of meristic summaries for individual species. These data will comprise the necessary information for a general revision of eastern pacific tonguefishes. Also, data gathered from examination of these specimens were incorporated into a comprehensive survey of interdigitation patterns of dorsal-fin pterygiophores in symphurine tonguefishes.



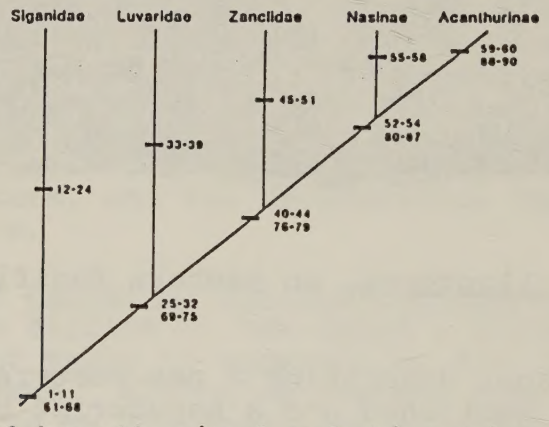
Symphurus callopterus, an eastern Pacific tonguefish.

In 1989, a paper describing a new eastern Pacific species of tonguefish was published and a manuscript correcting nomenclature for S. melanurus was accepted for publication. Four additional manuscripts describing new species of Symphurus occurring in the Atlantic and eastern Pacific oceans were submitted for publication in 1989. The content of these papers includes a general revision of eastern Atlantic species (with descriptions of two previously undescribed species) and description of five new species of eastern Pacific Symphurus. A revision of western Atlantic tonguefishes of the S. plagusia complex, including description of two new species from shallow-waters of the Caribbean Sea, was also submitted.

Comparative material of Indo-West Pacific Symphurus was also identified and data summaries made from counts taken from X-rays in preparation for revisionary studies of species occurring in this region.

4. Fishes of Walters Shoals.- Walters Shoals, a shallow-water seamount 400 nautical miles south of Madagascar and 600 nm east of South Africa, is part of a chain of 7 islands and seamounts that extend along the West Wind Drift from Tristan da Cunha in the South Atlantic to Amsterdam and St. Paul in the Indian Ocean. The shallow-water fishes of Walters Shoals were sampled with a number of techniques during cruise 17 of the Soviet oceanographic vessel Vityaz in 1988. The fish fauna of Walters Shoals consists of about 19 species, including five endemic to the entire chain, two of these apparently undescribed, and another found only at the four Indian Ocean seamounts and islands. A paper has been prepared with Dr. N. V. Parin for submission in 1990. Two other manuscripts are in preparation describing new species of scorpionfish and moray eel.

5) New family tree for louvar.- The louvar (Louvaris imperialis), a fish of the upper layers of the open ocean, had been thought to be related most closely to the scombroids (mackerels, tunas, etc.) or carangoids (jacks, scads, etc.). New research, particularly into early life stages and into skeletal design, shows the louvar to be a highly-specialized member of the normally reef-associated acanthuroids (surgeonfishes and their allies). A monograph on the louvar was published in the Smithsonian Contributions To Zoology by Dr. Collette and three colleagues.



Cladogram of hypothesized relationships of louvar (Luvaridae) and relatives.

6) Laboratory ichthyologist receives award.- At the 1989 annual meeting of the American Society of Ichthyologists and Herpetologists in San Francisco, Dr. Bruce B. Collette, Director of the Systematics Laboratory, was presented with the first Robert H. Gibbs, Jr. Memorial Award. The award is offered annually "for an outstanding body of published work in systematic ichthyology by a citizen of the Western Hemisphere". Dr. Collette has had published over 130 papers including three major monographs on tunas, bonitos, and Spanish mackerels which received "best publication" awards from the Fishery Bulletin.

7) Part 9 of the Sears Foundation Memoir, "Fishes of the western North Atlantic, consists of two volumes treating 180 species of eels and gulper eels. The first volume of 655 pages includes accounts of the adult eels; the second volume of 398 pages treats the leptocephali larvae of 157 species of eels, and contains the literature cited. Dr. Collette is Chairman of the Editorial Board for the series.

CRUSTACEANS

The groups of crustaceans most directly important to fisheries are the shrimps (mainly penaeoid species), lobsters, and crabs. Research on shrimps in the National Systematics Laboratory is conducted by Dr. Isabel C. Canet (Pérez Farfante), and that on crabs, lobsters, and other decapods by Dr. Austin B. Williams.

The shrimp fishery is the most valuable single segment of the U. S. fishing industry. In 1989, domestic commercial landings amounted to 351,514,000 lbs (heads-on-weight) with an ex-vessel value of $467,571,000, and an additional 502,964,000 lbs (heads-off), with a value of $1,705,187,000, were imported. To satisfy this great demand, more species have been added to the list of commercially valuable shrimps during the last few years, and new beds have been exploited both in nearby and distant regions, in both shallow and deep waters. Wise management efforts and meaningful ecological and physiological studies require thorough knowledge of the systematics of these crustaceans.

Crabs and lobsters are among the most conspicuous animals in catches from heavily fished marine waters of the world. In combination, they yield about half of the tonnage of domestic crustacean fishery production and nearly half of its dollar value. In their adult phase they are prominent members of bottom communities, ranging from marshlands and estuaries through nearshore systems to the deep sea, and they occupy dominant positions in the biological communities where they live. A huge literature exists for some species that are seemingly well known, but because of faulty oversimplified descriptions and distribution ranges, community relationships of many such species may be poorly understood. Still other species have been uncritically identified, and many have never been recognized and described.

1) Names of decapod crustaceans.- A list of scientific and common names of decapod crustaceans of the United States and Canada has been issued by the American Fisheries Society as Special Publication 17. All 1,614 species known from the fresh waters of North America north of Mexico and marine species within the 200 mile limit of the United States and Canada are included. Development of this list was chaired by Dr. Williams, with the help of many contributors, including Dr. Perez-Farfante.

Common and Scientific Names of Aquatic Invertebrates from the United States and Canada:

Decapod Crustaceans

Austin B. Williams, *Chair*
Lawrence G. Abele, Darryl L. Felder, Horton H. Hobbs, Jr.,
Raymond B. Manning, Patsy A. McLaughlin, and
Isabel Pérez Farfante

Committee on the Names of Decapod Crustaceans of the Crustacean Society

2) Lobster exhibit at Natural History Museum.- An exhibit, "Lobster Tales....diversity and world fishery" that opened in the National Museum of Natural History, Washington, D. C. in September is centered around color photographs of spiny lobster tails taken from the prize-winning paper "Lobsters - Identification, World Distribution, and U. S. Trade" by A. B. Williams, Mar. Fish. Rev. 48(2):1-36, 1986. Also included are a mural showing migrating Caribbean spiny lobsters, illustrated differences between clawed, spiny, and flat lobsters, claws of an American lobster, a model of a Norway lobster, diverse preserved lobsters on a rotating platform, mapped lobster fisheries of the world, fossil spiny lobsters, copies of the original MFR publication and its sequel "Lobsters of the world in U. S. trade" published by Osprey Books. The exhibit will remain on display for a year.

3) New genus, two new species of box crabs.- Exploratory trawling with the old Bureau of Commercial Fisheries research vessels Pelican, Combat, Silver Bay, and Oregon, and with NOAA research vessel Oregon II, yielded large collections of decapod crustaceans which are stored at the National Museum of Natural History. Recent study of those crustaceans has produced one genus (Cyclozodion) and two species of box crabs new to science (family Calappidae) in the tropical-subtropical Northwestern Atlantic.

4. Hydrothermal-vent crustaceans.- Hydrothermal vents, as well as cold brine and hydrocarbon seeps in the world oceans have become major foci of oceanographic discovery and research in the past 15 years. With the aid of increasingly sophisticated exploratory techniques and equipment operated by NOAA and other agencies, these features have come to be recognized as widely associated with tectonically active zones of the ocean floor. The vents have been in existence since very early in the earth's history, and through geological and biological processes have had profound influence on the oceans. Through time, representatives of many organismic groups have adapted to unique systems of nutrition in these environments at depths beyond the reach of light, and among the groups represented are decapod crustaceans. From the first discovery of the vents, Dr. Williams has been describing decapods collected from them in a series of papers. One paper and still others continue in preparation as discovery unfolds.

5. Fossil hydrothermal vents.- Fossil warm springs in deposits of the Late Cretaceous Western Interior Seaway, now in South Dakota, have yielded fossil crabs. Drs. Austin Williams and Gale Bishop of Georgia Southern College, have completed draft manuscripts on these crabs and on preservational aspects of fossil ghost shrimps and other crabs, the most numerous fossil decapod crustacean remains, from other deposits of the same age.

6. Catalog of genera and subgenera of penaeoid shrimps.- A contract was prepared and submitted for Dr. Canet to prepare a catalogue of the genera and subgenera of penaeoid shrimps. For each of the 29 generic-groups, the following information is needed: original reference, synonyms, type-species, gender, list of nominal species, and distribution. Material will be selected for illustration. A key and bibliography will also be prepared. After approval, it is estimated that it will take about a year to gather the needed information.

Box crab, Cyclozodion angustum, illustrated by K. Moore. Drawing depicts the shape and position of the carapace, eyes, and part of left cheliped.

SQUIDS

Squid fisheries, both in U.S. waters and worldwide, concentrate on species from two families, Loliginidae and Ommastrephidae. In the United States, these fisheries currently are primarily an export industry, although utilization in the United States is increasing.

Loliginids include many species of demersal squids which attain medium to large sizes and which are both common and abundant on continental shelves. The loliginids in U. S. waters include species that are harvested commercially (19,705 metric tons from the east coast U. S. fishery in 1988, and 22,000 tons from the California fishery) but which are quite difficult to identify. Additionally, there are several other species of small loliginids found in U. S. waters. Generic relationships of the species are presently very confused. Four conflicting classification schemes have been proposed, based on single characters, on regional material, or on arguments that have been institutionalized in outdated literature. Because the diverse family Loliginidae is cosmopolitan, the only way to resolve relationships within it adequately is by a worldwide systematic review of the taxonomic characters. Dr. Michael Vecchione, together with several colleagues, is reviewing the loliginids.

Commercially and ecologically, the most important ommastrephids in U. S. waters belong to the genus Illex. The catch of Illex in U. S. waters in 1988 (1967 metric tons) was limited because of market domination by large catches of Illex from the Falkland Islands. There are four groups of Illex in the western Atlantic which are more or less distinct morphologically. It has been proposed that these morphotypes are separate species, although some authors still consider them to be subspecies. These arguments, based primarily upon preserved specimens, have not fully considered other components of morphological variability (e.g., geographic, seasonal, sexual, ontogenetic). Dr. Vecchione is conducting a study of Illex which will treat several components of variability from fresh as well as preserved material.

1) Guide to Northeast squids and octopods.- A guide to the 13 species of squids and octopods of the Northeast continental shelf has been published as NOAA Tech. Rept. NMFS 73. The guide includes: an identification key with diagnostic illustrations; information on the species that occur regularly on the Northeast shelf; and a checklist of 107 other species that might occur there occasionally.

2) Volume on Cephalopod Systematics and Biogeography.- Together with Prof. Nancy Voss, University of Miami, and Dr. Ronald Toll, University of the South, Dr. Vecchione is editing a volume on Cephalopod Systematics and Biogeography. The multi-authored volume, which will be issued as a Smithsonian Contribution to Zoology, results from a two-week international workshop conducted at George Washington University and sponsored by the Smithsonian Institution.

CORALS

Corals and coral ecosystems are important sources of esthetic and recreational enjoyment, habitat for commercially harvested finfish and shellfish, material for curio items and objects d'art, and specimens for scientific and educational inquiry. Coral resources are subject to adverse effects associated with channel dredging, vessel anchoring and groundings, recreational diving, specimen collecting, commercial fishing, offshore oil and gas development, municipal and industrial waste outfalls, land runoff, and other human activities.

Threats to domestic coral resources pose difficult management problems which are addressed currently through a patchwork of state and federal regulatory and management programs. Foremost among these programs are those concerned with managing state and federal parks, marine sanctuaries, commercial fisheries, offshore mineral development, and coastal zone development.

Efficient management and regulation of these resources and accurate ecological and physiological research on them depend upon a thorough knowledge of systematics. Early taxonomic workers had a restricted amount of material at their disposal and often based their designation of species on single specimens or, at most, a small series. They did not appreciate that the majority of corals show a considerable range of variations in skeletal characters. Thus, early taxonomic work led to an unnecessarily complicated situation that is still in the process of being disentangled today.

1. Skeletal variation of poritid corals off Belize.- A multivariate statistical analysis is underway to characterize skeletal variation of Porites coral colonies off Belize; 73,380 measurements have been taken on 1165 colonies of this common coral. This research, conducted by LCDR Stephen Jameson, will provide a comparison baseline for future biochemical studies on taxonomy of this important coral genus.

SCIENTIFIC ILLUSTRATION

Ms. Keiko Hiratsuka Moore, scientific illustrator at the Systematics Laboratory (NMFS) since 1971, was awarded the Director's Award from the Northeast Fisheries Center. Presentation of the award was made by Mr. Allen E. Peterson, Jr., Science and Research Director of the Northeast Fisheries Center, during a luncheon at the Natural History Museum. The award is presented to employees of the Northeast Fisheries Center in recognition of and appreciation for outstanding performance and unique contribution for furthering the NOAA/NMFS mission.

FIELD WORK

In May, Dr. Austin Williams, Dr. Gale A. Bishop (Georgia Southern College), and Dr. Darryl L. Felder (University of Southwestern Louisiana) collected samples of stone and fiddler crabs, as well as ghost shrimps, from southern Georgia for morphometric, larval, and electrophoretic studies.

Dr. Williams and Dr. Bishop also collected fossil decapod crustaceans from late Cretaceous deposits in northwestern South Dakota during early September.

Field work on two cephalopod projects continued during this year. Oceanic species are being observed alive and collected undamaged in a collaborative project using the Johnson Sea-Link manned submersibles. Dr. Vecchione participated in a submersible cruise in the Bahamas during October. The other project is designed to collect fresh specimens of paralarval cephalopods from the Straits of Florida. In July, Dr. Vecchione travelled to the Smithsonian Marine Station in Florida to continue the field work for this project.

During February, Dr. Vecchione participated in NOAA's survey of Antarctic Marine Living Resources (AMLR) aboard R/V Surveyor.

Methods of counting plicae in species of sand lances (Ammodytes).

SERVICE

In addition to their research responsibilities, scientists from the Systematics Laboratory serve the scientific community and the public in other ways. The primary service functions of this Laboratory are to provide expert identifications for groups of fishes, crustaceans, squids, and corals in which we specialize, and to furnish information on these animals. We assist visitors in the use of the national collections. We review manuscripts for scientific publications, for colleagues in NMFS, and other agencies. Finally, we assist staffs of the divisions of Fishes, Crustacea, and Mollusks of the National Museum of Natural History with curation and loans, especially material collected by NMFS.

IDENTIFICATIONS

ORGANIZATION	CONTACT
Australian Museum	J. Paxton
Bermuda Dept. Agric., Fish. & Parks	F. Eddy
Bishop Museum, Hawaii	J. Randall
Food and Drug Administration	-
Georgia Southern College	G. A. Bishop
Gulf Coast Research Laboratory	R. Heard
Harbor Branch Oceanographic Institute	J. Reed
Indian River Coastal Zone Museum	J. E. Miller
Institute of Oceanographic Sciences, Plymouth, England	P. Herring
Leigh Marine Lab, New Zealand	M. Francis
Los Angeles County Museum	C. Swift
Museum National d'Histoire Naturelle, Paris	D. Guinot
National Geographic Society	M. Kenna
National Marine Fisheries Service, Northeast Center	D. Flescher
National Marine Fisheries Service, Tiburon Laboratory	D. Woodbury
National Museum of New Zealand	C. Paulin
National Tumor Registry	P. Spero
North Carolina State University	L. Levin
Pacific Sea Trade	J. Welch
Private sector, Detroit	J. Langhammer
Private sector	D. Lindholm
Private Sector, Dominican Republic	D. K. Wetherbee
Queensland Museum, Australia	P. Davie
Royal Ontario Museum, Canada	R. Winterbottom
Scripps Institution of Oceanography	R. Hessler, R. Kaufmann
Smithsonian Institution	T. Coffer, J. Mead, S. Cairns, M. Sweeney, J. Harasewych
Tulane University Museum	R. Suttkus
U.S. Fish & Wildlife Service	R. Labourne
University of Guam Marine Laboratory	L. G. Eldredge

IDENTIFICATIONS

ORGANIZATION	CONTACT
University of Houston	L. J. Lester
University of Miami	C. G. Messing
University of North Carolina, Wilmington	A. McCrary
University of Puerto Rico	C. Cutress
University of Rhode Island	K. Wishner
Virginia Institute of Marine Science	G. Grant, J. Olney, D. Eggleston

INFORMATION

ORGANIZATION	CONTACT
America Samoa, Dept. Mar. Wildlife Resour.	B. Bookheim
Atlantic Reference Collection, St. Andrews	K. Sulak
Bermuda Dept. Agric., Fish. and Parks	B. Luckhurst, F. Eddy
Bruce Morgan Assoc., Washington, D.C.	C. Horrigan
California Academy of Sciences	T. Roberts
Cape Nature Conservation, South Africa	C. Gaigher
Cent. Invest. Biolog. Baja California Sur, Mexico	R. Rodríguez-Sánchez, P. Whitehead
Columbia Union College, Takoma Park	R. Wasmer
East Stroudsberg University	C. Fernández
Edward Fusco, Inc., NY	E. Fusco
Environmental Protection Agency	L. Manning
FAO, Fiji	R. Gillett
Florida Department of Natural Resources	R. Crabtree
Florida Marine Research Institute	D. Camp
Florida State University	L. Abele
Food and Drug Administration	N. Hastings, J. Kidwell, J. Travers, M. Snyder, J. Noonan
Georgia Southern College, Statesboro	G. Bishop
Gulf Coast Res. Lab, Ocean Springs, MS	R. Heard, S. Poss
Harza Engineering	J. Meldrin
Huntsman Marine Laboratory, St. Andrews, Canada	L. van Guelpen
Institute of Oceanology, Qingdao, China	J. Liu
INVEMAR, Colombia	J. Garzon-F.
Kent State University, Ohio	R. Feldmann
Kumamoto University, Japan	K. Baba
London School of Economics	C. Bilger
May River Corporation	R. Owen
Ministerio de Pesca, Mexico	T. Hidalgo
Mondial Company	A. Towers
National Academy of Sciences	D. Johnston
National Geographic Society	M. Kenna, K. Steer
National Marine Fisheries Service, Trade and Service, Washington	J. Brooker
NMFS, Beaufort	G. Huntsman
NMFS, Galveston	T. Czapla

INFORMATION

ORGANIZATION	CONTACT
NMFS, Gloucester	R. Learson, C. Marten
NMFS, Miami	M. Justin
NMFS, Panama City	Librarian, S. Malotti
NMFS, Pascagoula	D. Maher
NMFS, Sandy Hook	T. Pacheco
National Oceanographic Data Center	D. Hardy
National Zoo, Invertebrate Dept.	E. Woo
New England Aquarium	L. Kaufman
NOAA Antactic Program	L. Claywell, T. MacIntyre
North Carolina Central University, Durham	J. Clamp
Oceanic Institute, Hononlulu	J. Lewis
Oficina Nacional de Evaluación de Recursos Naturales	M. Mispireta
Private Individual, York, PA	-
Pro Vita Foundation, Rio de Janeiro	A. Guimaraes, R. Silveira
Raymar Commodities	R. Martínez
Santa Barbara Museum	F. Hochberg
Shelly International Marketing, Chicago	-
Smithsonian Institution	M. Jones, K. Kolter, M. Schotte, R. Germon
Smithsonian Press	P. Cannel
Smithsonian Tropical Research Institute	L. Gilaldo
Texas A & M University	J. McEachran
Time-Life Books	M. Harrison
United States Customs, NY	T. Brady
United States Department of Agriculture	W. James
U. S. Fish Wildlife Ser., Division of Fish and Wildlife Management Assistance	J. Howarth
Universidad Nacional, Colombia	A. Acero
University of Buenos Aires, Argentina	M. Aguirre-Urreta
University of California, Los Angeles	J. Parrish
University of Guelph	D. Webster
University of Hawaii	D. Yanagimadii
University of Illinois, Chicago	R. Plotnick
University of Maryland	F. Nouguera
University of Phillipines, Marine Sciences Institute	R. de la Paz
University of South Carolina	W. Anderson
University of South Florida	D. Alberdi
University of Southwestern Louisiana	R. Dauer, D. Felder
University of Tel-Aviv, Israel	B. Galil
University of Texas, Galveston	P. Lee
University of Wisconsin, Oshkosh	M. Mahadeva
Victoria Museum, Melbourne, Australia	R. Wilson
Virginia Institute of Marine Science	L. Daniel, H. Banford C. Barr
World Book, Chicago	F. Wu

MANUSCRIPTS REVIEWED

Reviews of 30 manuscripts were provided for:

American Society of Ichthyologists and Herpetologists North American Fish Symposium
Annul. Inst. Biol., UNA Mexico
Atoll Research Bulletin
Proceedings of the Biological Society of Washington
Bulletin of Marine Science
Proceedings of the California Academy of Sciences
Canadian Journal of Fisheries and Aquatic Sciences
Copeia
Fisheries
Fishery Bulletin, U. S.
Japanese Journal of Ichthyology
Los Angeles County Museum, Contributions in Science
Malacologia
Journal of Crustacean Biology
National Marine Fisheries Service, Technical Report Series
Pacific Science
Pakistan Journal of Scientific and Industrial Research
Symposium Acta- Haliotis
Smithsonian Contributions to Zoology
Systematic Zoology

50 manuscripts were also reviewed for authors at their request.

RESEARCH PROPOSALS REVIEWED

23 proposals were reviewed for the following organizations:

Agency for International Development
All-Union Research Institute of Marine Fisheries and Oceanography, VNIRO, Moscow
American Philosophical Society, Philadelphia
Center for Field Research
Guggenheim Foundation
Institute of Taxonomic Zoology, Amsterdam
Louisiana Board of Regents
Louisiana Sea Grant College Program
National Geographic Society
Northeast Fisheries Center
Pontificia Universidad Católicade Chile, Santiago
Smithsonian Oceanographic Sorting Center, National Science Foundation Cooperative Systematic Studies, Analysis of Polar Biological Materials
Virginia Institute of Marine Science

PROFESSIONAL ACTIVITIES

AMERICAN FISHERIES SOCIETY

Dr. Collette served as member of the committee to count ballots for the Southeastern Division.

Dr. Williams served as a member of the Committee on Names of Aquatic Invertebrates.

AMERICAN SOCIETY OF ICHTHYOLOGISTS AND HERPETOLOGISTS

Drs. Collette and Munroe attended the annual meeting held in San Francisco. Dr. Munroe presented a paper "Revision of eastern Atlantic tonguefishes (Symphurus: Cynoglossidae)". Dr. Collette also presented a paper "The shallow-water fishes of Walters Shoals". Dr. Collette continued as chairman of the Ichthyological Collections Committee and conducted an open meeting of the committee at the annual meeting.

AMERICAN SOCIETY OF ZOOLOGISTS

Drs. Collette and Williams participated in the annual meetings of the American Society of Zoologists and the Society of Systematic Zoology in Boston in December. Dr. Williams presented a paper on the systematics of the western Atlantic mudshrimps (Upogebia) in a symposium of the Crustacean Society.

BIOLOGICAL SOCIETY OF WASHINGTON

Dr. Williams served as chairman of the Nominating Committee and member of the Council and was appointed as Custodian of Publications.

Dr. Collette participated in meetings as a member of the council.

Dr. Vecchione was elected Treasurer of the Society.

CEPHALOD INTERNATIONAL ADVISORY COUNCIL

Dr. Vecchione continued to serve as an elected member of the council.

CYBIUM

Dr. Collette continued as a member of the Editorial Board.

FISHERY BULLETIN

Dr. Collette served on the Editorial Committee and as a member of the Best Publications Award Committee.

FISHES OF THE WESTERN NORTH ATLANTIC

Dr. Collette continued to serve as Chairman of the Editorial Board and conducted an open meeting of the Editorial Board at the ASIH meetings in San Francisco.

INTERNATIONAL GEOLOGICAL CONGRESS

Dr. Williams attended a symposium on taphonomy (preservational processes) at the Congress in Washington where Dr. Gale of Bishop of Georgia Southern College presented a paper co-authored with Dr. Williams, "Taphonomy and preservation of burrowing thalassinidean shrimps."

JOURNAL OF CRUSTACEAN BIOLOGY

Dr. Williams served as an Associate Editor.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION ANTARCTIC PROGRAM

Drs. Munroe, Vecchione, and Williams participated in a two day intensive training session for NOAA-Corps Officer, Lieutenant Commander L. Claywell, on identification of commercially important and regulated species of Antarctic crabs, fishes, and squids. Lt. Claywell received this training in anticipation of participation as an observer aboard foreign fisheries vessels working in Antarctic waters.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION ESTUARY OF THE MONTH

Drs. Collette and Munroe attended seminars on the Gulf of Maine estuary.

SMITHSONIAN INSTITUTION

Drs. Collette and Munroe served as Research Associates in the Department of Vertebrate Zoology, Drs. Canet, Williams, and Vecchione in the Department of Invertebrate Zoology.

Dr. Collette edited the English translation of Lindberg and Krasyukova's Fishes of the Sea of Japan, Part 4.

Dr. Collette served as advisor for a summer intern studying the comparative osteology of two species of double-lined mackerels (Grammatocynus).

Dr. Munroe served as a member of the Selection Committee for Summer Interns for the Vertebrate Zoology Department.

Dr. Vecchione was an invited participant in meetings to review plans for construction of permanent facilities at the Smithsonian Marine Station at Link Port, Fort Pierce, Florida.

Dr. Williams served as chairman of the Smithsonian Oceanographic Sorting Center Arthropod Advisory Committee.

THIRD INTERNATIONAL CONFERENCE ON SYSTEMATICS AND EVOLUTION OF INDO-PACIFIC FISHES

Dr. Collette attended the meeting and presented a paper entitled: "Fishes of the West Wind Drift Islands".

WILLI HENNIG SOCIETY

Dr. Collette attended the meeting at Cornell University and served as a member of the Council.

OTHER MEETINGS ATTENDED

AMERICAN ASSOCIATION OF ZOOLOGICAL NOMENCLATURE
AMERICAN FISHERIES SOCIETY, POTOMAC CHAPTER
ATLANTIC ESTUARINE RESEARCH SOCIETY
ESTUARINE RESEARCH FEDERATION
NOAA- INTERNATIONAL AND INTERGOVERNMENTAL LIAISON STAFF WORKSHOP

UNIVERSITY AFFAIRS AND TEACHING

BERMUDA BIOLOGICAL STATION

Dr. Collette taught a four-week course, "Biology of Fishes", to a class of 13 students from 6 countries at the Bermuda Biological Station in August.

JOHNS HOPKINS UNIVERSITY

Ms. Moore demonstrated techniques of scientific illustration of fishes, squids, and crustaceans to 15 graduate students from the Department of Medical Art.

TULANE UNIVERSITY

Dr. Collette presented an invited lecture on systematics and evolution of scombroid fishes.

UNIVERSITY OF MARYLAND

Dr. Munroe presented lectures on systematics and diversity of teleost fishes to undergraduate and graduate students enrolled in a Marine Vertebrate Zoology course.

UNIVERSITY OF SOUTH CAROLINA

Dr. Collette presented a seminar to the Biology Department on the systematics and evolution of scombroid fishes.

Dr. Collette participated in the senior honor's thesis defense for W. D. Anderson III on Hemirhamphodon.

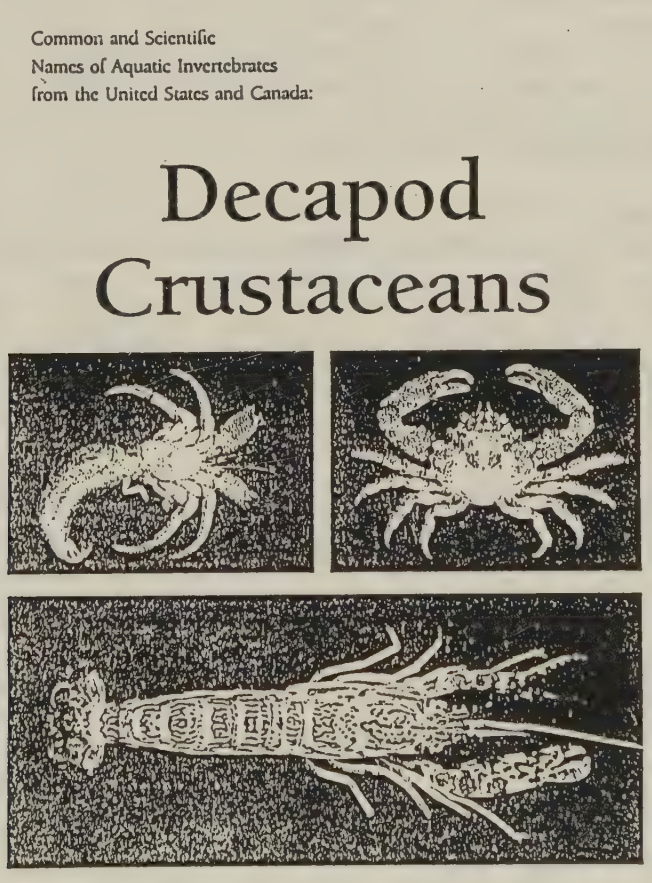
VIRGINIA INSTITUTE OF MARINE SCIENCE/ COLLEGE OF WILLIAM AND MARY

Dr. Collette conferred with Ms. Heidi Banford on her thesis project on halfbeak systematics.

Dr. Vecchione served as a member of the Associate Faculty. He presented a lecture and video of squids as part of the VIMS seminar series and a lecture for the Introductory Biology course.

WASHINGTON, D.C. AND MARYLAND INTERMEDIATE SCHOOLS

Ms. Moore presented an informal talk and demonstrated scientific illustration techniques to 25 eighth and ninth grade students from Washington, D. C. and nearby Maryland schools who were participants in the "I Have A Dream Foundation's" program for disadvantaged young people. This experience was to provide students with an introduction to careers in science and to enhance basic skills and self esteem.



Frontispiece from American Fisheries Society Special Publication 17: Common and Scientific Names of Decapod Crustaceans from the United States and Canada.

NATIONAL SYSTEMATICS LABORATORY PUBLICATIONS, 1989

Bishop, G. A. and A. B. WILLIAMS. Taphonomy and preservaton of burrowing thalassinidean shrimps. 28th Int. Geol. Congr., Washington, D. C., July 9-19, Abstracts, Vol. 1:156.

Felley, J. D., M. VECCHIONE, G. R. Gaston, and S. M. Felley. Habitat selection by demersal nekton: Analysis of videotape data. Northeast Gulf Sci. 10(2):69-84.

MUNROE, T. A. and M. N. Mahadeva. Symphurus callopterus, (Cynoglossidae, Pleuronectiformes), a new species of deepwater tonguefish from the eastern Pacific. Proc. Biol. Soc. Washington 102(2): 458-467.

NIZINSKI, M. S. Ecological distribution, demography, and behavioral observations on Periclimenes anthophilus, an atypical "cleaner" shrimp. Bull. Mar. Sci. 45(1):174-188.

Springer, V. G. and B. B. COLLETTE. Obituary: Robert H. Gibbs, Jr., 1929-1988. Copeia 1989(1):245-251.

Tyler, J. C., G. D. Johnson, I. Nakamura, and B. B. COLLETTE. Morphology of Luvarus imperialis (Luvaridae), with a phylogenetic analysis of the Acanthuroidei (Pisces). Smithsonian Contrib. Zool. No. 485, 78 p.

VECCHIONE, M. Zooplankton distribution in three estuarine bayous with different types of anthropogenic influence. Estuaries 12(3):43-53.

VECCHIONE, M., C. F. E. Roper, and M. J. Sweeney. Marine flora and fauna of the northeastern United States. Mollusca: Cephalopoda. NOAA Tech. Rep. NMFS 73:1-23.

WILLIAMS, A. B. (Chairman), L. G. Abele, D. L. Felder, H. H. Hobbs, Jr., R. B. Manning, P. A. McLaughlin, and I. PÉREZ FARFANTE. Common and scientific names of aquatic invertebrates from the United States and Canada. Decapod crustaceans. Am. Fish. Soc. Spec. Publ. 17, 77 p.

WILLIAMS, A. B. and C. A. Child. Comparison of some genera and species of box crabs (Brachyura: Calappidae) of the southwestern North Atlantic with description of a new genus and species. Fish. Bull., U.S. 87(1):105-121.

WILLIAMS, A. B. and P. J. B. Scott. A new species of coral-boring shrimp (Upogebia) from the West Indies (Decapoda: Upogebiidae). Proc. Biol. Soc. Washington 102(2):405-410.

PAPERS IN PRESS

COHEN, D. M. Families Argentinidae, Bathylagidae, Melanonidae, Moridae, Gadidae, and Bregmacerotidae. In: Check-list of Fishes of the eastern Atlantic Tropical Atlantic. J. C. Quero, ed., UNESCO.

COLLETTE, B. B. Family Scombridae. In: Check-list of Fishes of the eastern Atlantic Tropical Atlantic. J. C. Quero, ed., UNESCO.

COLLETTE, B. B. and N. V. Parin. Families Belonidae and Hemiramphidae. In: Check-list of Fishes of the eastern Atlantic Tropical Atlantic. J. C. Quero, ed., UNESCO.

COLLETTE, B. B. Problems with grey literature in fishery science. AFS Writing for Fishery Journals, Symp. Vol.

Hanlon, R. T., S. v. Boletzky, T. Okutani, G. Pérez-Gandaras, P. Sanchez, C. Sousa-Reis, and M. VECCHIONE. Suborder Myopsida Orbigny, 1845. In: "Larval" and Juvenile Cephalopods. A Manual for Their Identification. M. J. Sweeney et al., eds. Smithsonian Contr. Zool.

Mahadeva, M. N. and T. A. MUNROE. Three new species of eastern Pacific tonguefishes (Symphurus: Cynoglossidae). Proc. Biol. Soc. Washington.

MUNROE, T. A. Symphurus melanurus Clark, a senior synonym for the eastern Pacific tonguefishes, S. seychellensis Chabanaud 1955 and S. sechurae Hildebrand 1946. Copeia 1990(1).

MUNROE, T. A. Eastern Atlantic tonguefishes (Symphurus: Cynoglossidae, Pleuronectiformes), with descriptions of two new species. Bull. Mar. Sci. 47(3).

MUNROE, T. A. and M. S. NIZINSKI. Two new species of eastern Pacific tonguefishes possessing 11 caudal-fin rays. Copeia 1990(4).

NIZINSKI, M. S., B. B. COLLETTE, and B. B. WASHINGTON. Separation of two species of sand lance (Ammodytes americanus and A. dubius) in the western North Atlantic. Fishery Bulletin, U.S. 88(2).

Van Dover, C. and A. B. WILLIAMS. Egg size in squat lobsters (Galatheoidea): constraint and freedom. Crustacean Issues, Balkema, Rotterdam.

VECCHIONE, M. and V. A. Hand. Digestive-gland histology in paralarval squids (Cephalopoda: Loliginidae). Fish. Bull., U.S. 87(4).

STAFF

Bruce B. Collette	Laboratory Director and Ichthyologist
Isabel C. Canet (Pérez Farfante)	Carcinologist Emeritus
Thomas A. Munroe	Ichthyologist
Michael Vecchione	Squid Biologist
Austin B. Williams	Carcinologist
Stephen C. Jameson	Corallist (LCDR, NOAA Corps)
Grace Klein-MacPhee	Fishery Biologist
Martha Nizinski	Zoologist
Ruth E. Gibbons	Museum Specialist
Keiko H. Moore	Scientific Illustrator
Virginia R. Thomas	Secretary
Lori Beullah	Clerk-Typist
Rajaguru, A.	Visiting Investigator

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